

ACTION PLAN

Alberta Government Action Plan

On Climate Change

1996-1997 Progress Report



Alberta
Government of Alberta

Contents

Executive Summary	2
1.0 Background on Action Plan	3
2.0 Summary of 1995-96 Progress Report	3
2.1 Organizational Development	3
2.2 Baseline	4
2.3 Performance Indicators	5
2.4 Targets	5
3.0 Accomplishments in 1996-97	6
3.1 Buildings	6
3.1.1 Results	6
3.1.2 Specific Actions	8
3.2 Waste	8
3.2.1 Results	9
3.2.2 Specific Actions	9
3.3 Transportation	10
3.3.1 Results	10
3.3.2 Specific Actions	12
4.0 Supporting Activities	12
4.1 Research Activities	12
4.2 Other Activities	13
5.0 Workplan for 1997-98	15
6.0 Conclusion	16

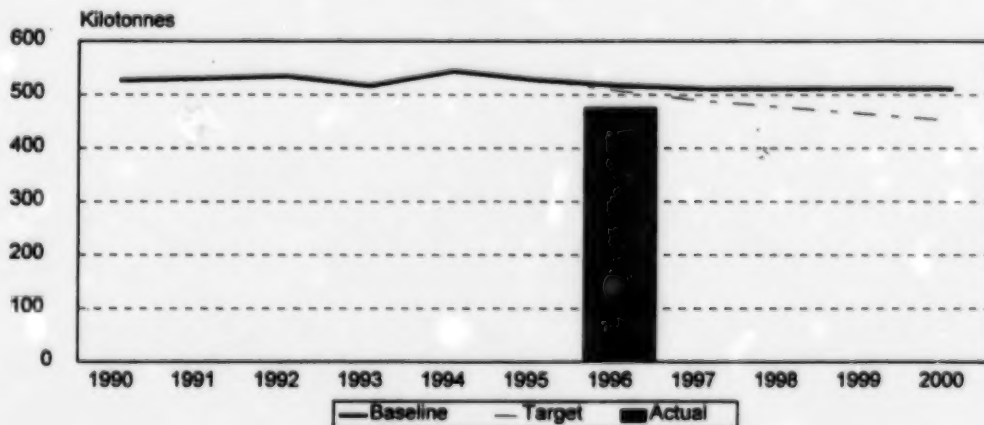
Executive Summary

The Government of Alberta submitted an Action Plan for Canada's Climate Change Voluntary Challenge and Registry Program in October 1995. The Action Plan focussed on measures that will directly result in reductions of greenhouse gas emissions from Alberta government operations over a three year period.

The Government of Alberta submitted its first annual Progress Report in September 1996. The Progress Report described the organization established to deliver the plan, the 1990 to 2000 baseline, a list of performance indicators, the target for the year 2000, and the cost-effective actions taken during the first year. The overall target is to reduce emissions by 14.1 per cent from 1990 levels by the year 2000.

This is the Government of Alberta's second annual Progress Report. This Progress Report describes the actions taken and the results from these efforts. Total emissions of CO₂ equivalent from all government operations decreased from 527 kilotonnes in 1995 to 476 kilotonnes of CO₂ equivalent in 1996, a 9.6 per cent reduction. These reductions exceed the adjusted target of 507 kilotonnes of CO₂ equivalent set for 1996. All three sources of emissions contributed to these reductions. The contribution of each emission source to the 51 kilotonnes of CO₂ equivalent reduction was: buildings, 33 kilotonnes; waste, 1.8 kilotonnes; and transportation, 16 kilotonnes. Part of the reductions are due to downsizing. Although the exact amount is difficult to determine, 20 kilotonnes result from reduced building area. Part of the waste and transportation reductions also result from downsizing.

Figure 1: Alberta Government Greenhouse Gas Emissions



1.0 Background on Action Plan

Greenhouse gas emissions related to Alberta government operations are mostly carbon dioxide. Emissions of methane, nitrous oxide and other greenhouse gases are less significant. The three major sources of carbon dioxide, in order of significance — and their potential for reducing emissions — are

- 1) energy used in buildings, mostly natural gas and electricity,
- 2) waste,
- 3) operation of vehicles in the government's transportation fleet.

In 1990, emissions of carbon dioxide from Alberta government operations was 526 kilotonnes or about one half of one per cent for the province as a whole. The Alberta government is showing leadership by taking cost-effective actions to reduce the greenhouse gas emissions generated by the Alberta government.

The Alberta government's Action Plan has seven objectives:

- implement actions that reduce greenhouse gas emissions related to Alberta government operations
- demonstrate the advantages of a voluntary approach
- take effective actions that save money
- profit from doing business in new ways
- show how others can take cost-effective action to reduce emissions
- share what we learn
- measure and report on cost-effective quantitative actions.

2.0 Summary of 1995-96 Progress Report

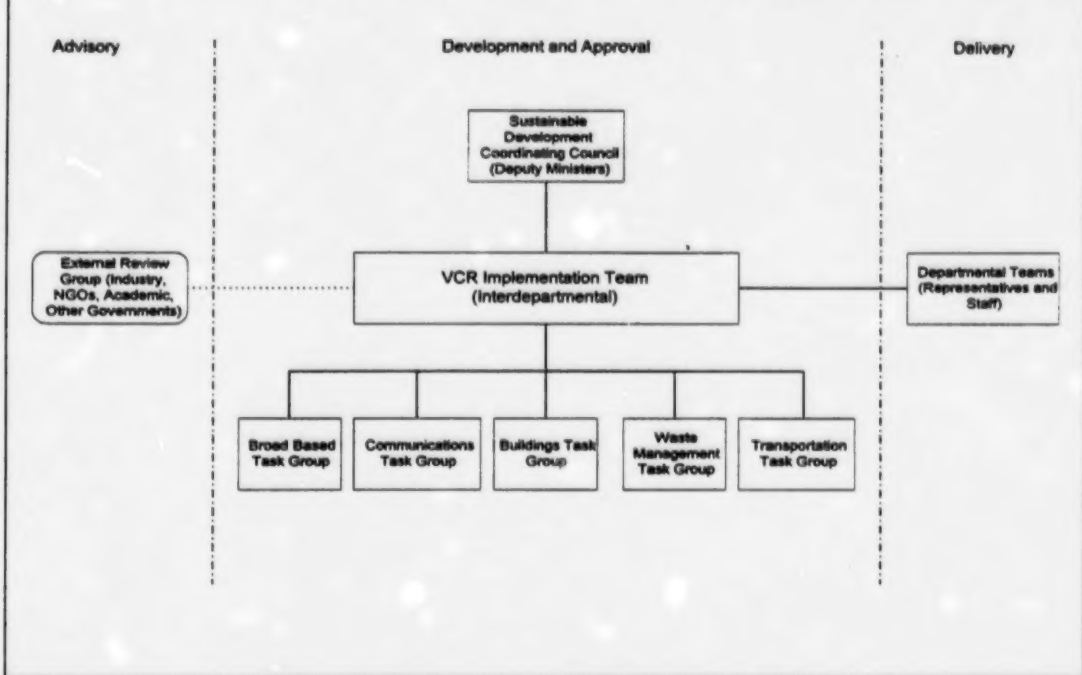
The Government of Alberta submitted its first annual Progress Report in September 1996. As outlined in the Action Plan submission, the focus of the first year was to establish an organization to deliver on the plan, develop a baseline, choose indicators, set targets, and take cost-effective actions building on existing programs (primarily in buildings). These goals have been accomplished as described below.

2.1 Organizational Development

An Implementation Team was established in December 1995 with representation from all government departments (see Figure 2). This team reports to a deputy minister level committee. The team provides overall coordination and direction for the Action Plan; ensuring integration of plans, actions and communication efforts.

Five task groups were established to develop sector specific plans and direct actions in these areas. Each group develops further actions by assessing the results from initial actions and investigating other potential actions.

Figure 2: Alberta Government VCR Management Structure



2.2 Baseline

A baseline was established for the period from 1990 to 2000 in the 1995-96 Progress Report. The baseline has been adjusted for this report due to a spreadsheet error in calculating the transportation emissions. The error increases transportation and overall emissions by 4 kilotonnes of CO₂ equivalent for the years 1995 through 2000. Table 1 has been adjusted for this error. For the 1990 to 1995 period, recorded historical data was used. When historical data was not available, extrapolations were made. Projections were made for 1996 to 2000 based on the Alberta government's three year business plan.

Table 1 summarizes the total tonnes of CO₂ equivalent for all Alberta government operations and for each emission source. It shows that emissions increased slightly to 527 kilotonnes of CO₂ equivalent

in 1995 from 526 kilotonnes in 1990. Emissions are projected to decrease 2.9 per cent to 511 kilotonnes of CO₂ equivalent by the year 2000, from 526 in 1990.

The largest emission source is energy use in buildings. Buildings represented 82.5 per cent of the 1990 total and are projected to increase to 90 per cent of total emissions in 2000 (due to reduction in the other sources). Transportation, the second largest contributor, is declining and predicted to decline even further through privatization of the fleet. Some of these emissions will not be eliminated as they are only transferred to the private sector. Transportation emissions will drop from 12.7 per cent of the total in 1990 to 7 per cent in 2000. Finally, waste declines to 2.7 per cent in 2000 from 4.9 per cent of emissions in 1990.

**Table 1: Alberta Government Baseline and
Targets for Greenhouse Gas Emissions**

Emission Source	Kilotonnes of CO2 Equivalent										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Buildings											
Baseline	434	434	441	434	463	460	460	460	460	460	460
Target							450	441	432	423	414
Transportation											
Baseline	67	71	71	62	64	52	43	36	36	36	36
Target							43	34	33	31	29
Waste											
Baseline	26	25	22	20	17	15	14	14	14	14	14
Target							13	12	11	10	9
Totals											
Baseline	526	530	534	516	544	527	517	511	511	511	511
Target							507	488	476	464	452

* Columns may not add up due to rounding

* 1990-1995 are actual figures

2.3 Performance Indicators

To measure the success of emission reduction actions taken, a series of performance indicators were chosen. The overall indicator for the action plan will be *the percentage of CO₂ equivalent of reduced emissions from Alberta government internal operations*. Two indicators have been chosen for each major emission source. For buildings, the indicators are *percentage reduction of CO₂ equivalent emissions* and *energy consumed per square meter per year*. For waste, the indicators are *percentage reduction of CO₂ equivalent emissions* and *waste disposal per employee per year*. For transportation, the indicators are *percentage reduction of CO₂ equivalent emissions* and *total amount spent on travel per employee per year*. The percentage reduction figures for each source will be added to calculate the

overall action plan indicator.

2.4 Targets

Table 1 shows the target emission reductions, adjusted from the 1995-96 Progress Report to take account of the spreadsheet error. The target has not been changed hence an additional 4 kilotonnes of emission reduction will be targeted for the transportation area. Emissions will be 14.1 per cent less in 2000 than in 1990. Emissions are targeted to be 452 kilotonnes of CO₂ equivalent in 2000, a 74 kilotonnes reduction between 1990 and 2000.

Targets have been established for each of the three emission sources. Based on these targets, an overall reduction target for the action plan was set.

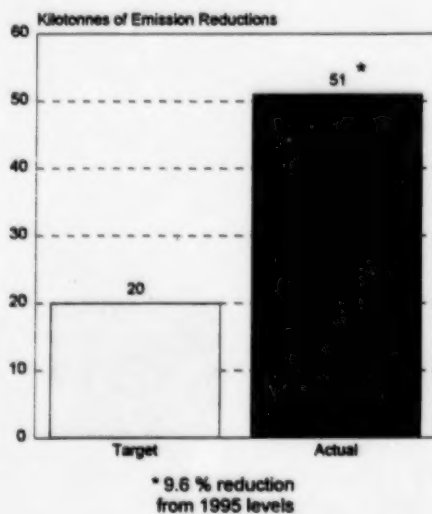
3.0 Accomplishments in 1996-97

Total emissions of CO₂ equivalent from all government operations decreased to 476 kilotonnes of CO₂ equivalent in 1996 from 527 kilotonnes in 1995, a 9.6 per cent reduction (see Figure 3). These reductions exceed the target of 507 kilotonnes of CO₂ equivalent set for 1996. All three sources of emissions contributed to these reductions. The reductions from each source were: buildings, 33 kilotonnes; waste, 1.8 kilotonnes; and transportation, 16 kilotonnes.

Performance Measures - Buildings

- 9.6 per cent reduction in CO₂ equivalent emissions from 1995 levels

Figure 3: CO₂
Reductions: Total



3.1 Buildings

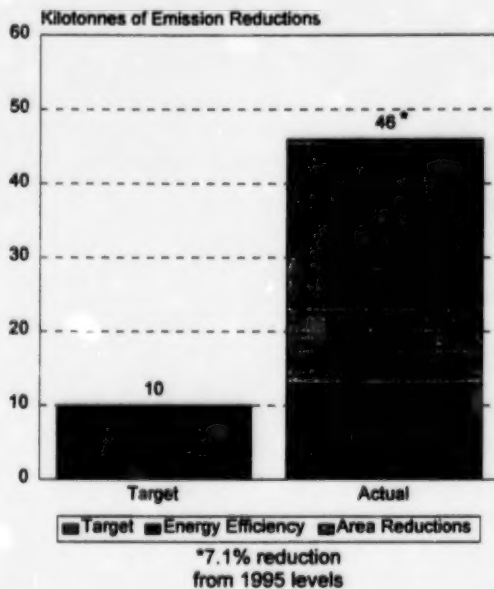
3.1.1 Results

Energy use was reduced in Alberta government buildings by 5.4 per cent during 1996 (see Figure 4). These savings result from energy efficiency actions (2.1 per cent), taken through energy performance contracting and improved maintenance and operation of the buildings, and a reduction in the total building space (3.3 per cent). These energy savings resulted in a reduction of 33 kilotonnes CO₂ equivalent, or 7.1 per cent. The energy savings were not adjusted for temperature. Since 1996 was a colder than average year, savings could have been higher. The percentage of CO₂ equivalent was greater than energy use saved because the largest energy savings were from electricity (8.4 per cent), which has higher related emissions, versus natural gas (4.2 per cent), with lower emissions.

Alberta government buildings have become more efficient. Building-related emissions were reduced to 427 kilotonnes of CO₂ equivalent from 460, below the target for 1996 of 450 kilotonnes of CO₂ equivalent. If one assumes the percentage savings for electricity and natural gas are equivalent for area reduced and energy efficiency reductions, then 13 kilotonnes were reduced through energy efficiency efforts and 20 kilotonnes from reduced area. The target was exceeded by 3 kilotonnes even if the reduction resulting from reduced area is removed. The building energy performance index (BEPI) has decreased to 1,867 from 1,909 megajoules per square meter in the past year.

Most of the energy efficiency gains came from changes in operation and maintenance of the buildings. A Building Management Information System records energy use in all government buildings using data from gas and electric utility bills.

**Figure 4: CO₂
Reductions: Buildings**



Building managers use this information to track energy use in their buildings and to help identify opportunities for savings. The department of Public Works Supply and Services provides additional energy efficiency information to the managers and encourages energy efficiency operating practices. In addition, a number of measures with short term paybacks have been taken using maintenance budgets.

Energy use savings resulted from energy performance contracts in the Alberta Vocational College and a group of 9 buildings in the Lethbridge area. Savings from these buildings will be reflected in this year's reductions. Twenty two buildings were audited in the northwest region of the province and follow-up actions are to be taken through an energy performance contract. A plan is in place for auditing the balance of the government's largest buildings. These preparations will lead to significant savings in

future years.

Although difficult to assess, some reduction may have resulted from changes in staff habits. The "Greenhouse Gas Emission Reduction Guide" was used by department representatives to inform and educate staff about measures to reduce greenhouse gases. The material was distributed through newsletters, e-mail and posters. In addition, labels with key messages were distributed throughout the government and attached to energy using equipment such as computers, printers and faxes, encouraging staff to shut off lights, printers and computers when not in use and to use e-mail.

A questionnaire was sent to all government branch heads for information on current practices which effect greenhouse gas emissions. The information provides a detailed baseline of habits which can be influenced and tracked in the future. The information is broken down by department so specific areas can be targeted. The following information was obtained:

- 91.6 per cent use energy efficiency criteria when purchasing office equipment (32.3 per cent purchased energy star computers, 25 per cent purchased double-sided printers, 59.1 per cent purchased photocopier with automatic double-sided copying, 32.3 per cent purchased faxes with reduced consumption in standby mode)
- 32.7 per cent have a printer capable of printing on both sides of the paper
- 38.3 per cent have a fax machine with an energy saving feature
- 43 per cent use energy efficient desktop computers, and
- 92.7 per cent encourage employees to turn off computers when not in use or after hours.

For most questions, 20 to 30 per cent of respondents had no answer to the questions. This

may mean they did not know if their equipment has energy efficient features, offering an opportunity to make further changes through education.

Performance Measures - Buildings	
•	7.1 per cent reduction in CO ₂ equivalent emissions
	Energy consumed per square meter decreased to 1,867 megajoules from 1,909

3.1.2 Specific Actions

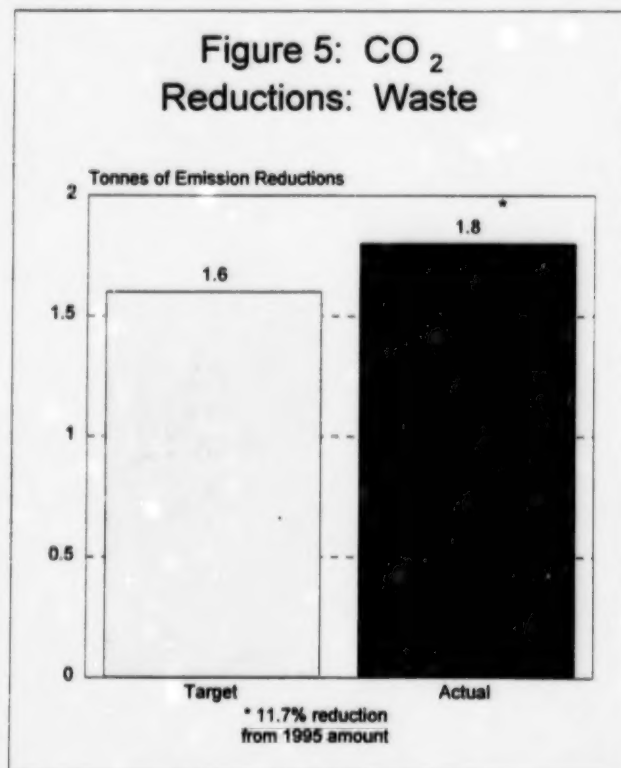
- Implemented a \$120,000 lighting retrofit in the Bowker building in Edmonton. This will result in \$29,000 savings per year for a payback of 4.1 years. Annual emission reductions will be 492 tonnes of CO₂ equivalent.
- Designed a \$90,000 lighting retrofit for the Haultain building in Edmonton. \$20,000 in savings per year for a 4.5 year payback. Annual emission reductions will be 260 tonnes of CO₂ equivalent.
- Designed a lighting retrofit for the Alberta Research Council building in Edmonton. Implementation costs: \$310,000. \$65,700 savings per year for a 4.7 year payback. Annual emission reductions will be 2,550 tonnes of CO₂ equivalent.
- Designed a lighting retrofit for buildings in the Lethbridge area. The implementation costs will be \$838,000 and result in \$166,000 savings per year for a 5.0 year payback. Annual emission reductions should be 260 tonnes of CO₂ equivalent.
- Final proposal stage for a lighting retrofit for buildings in the northwest area of the province. The implementation costs are projected to be \$1,260,000 with a savings of \$232,000 per year

for a payback of 5.4 years. The annual emissions reductions should be 2,884 tonnes of CO₂ equivalent.

- Distributed site specific stickers and posters throughout government offices to alert and encourage energy efficient actions.
- Provided energy efficiency tips to departmental coordinators for distribution to government staff.
- Offered owners of leased facilities an incentive to take cost-effective actions to reduce greenhouse gas emissions (The government agreed to pay the current energy bill for an agreed upon period). Any savings the building owner makes can be used to pay for an energy performance contract.

3.2 Waste

Figure 5: CO₂ Reductions: Waste



3.2.1 Results

Total waste disposal declined by 1 kilotonne to 7.4 kilotonnes from 8.4 kilotonnes, an 11.7 per cent reduction (see Figure 5). Although some reductions occurred through changes in practices, the amount cannot be calculated due to lack of data. Therefore, this kilotonne reduction is entirely due to downsizing.

Current figures for 1996 waste disposal rates per capita are unavailable. A change in the definition of waste and a shift (from the provinces to Statistics Canada) has delayed the release of per capita rates. A waste disposal rate of 300 kilograms per employee per year, unchanged from last year, was used. Without 1996 waste disposal rates per employee, it is impossible to assess movement towards the target of reducing the emissions to 277 from 300 kilograms per employee per year. Per capita rates are expected to be lower than 300 kilograms for 1996.

The target for waste disposal emissions was to reduce to 13.4 from 15 kilotonnes of CO₂ equivalent. As emissions were reduced to 13.2 kilotonnes of CO₂ equivalent, the target was exceeded by 0.2 kilotonnes of CO₂ equivalent or 1.3 per cent.

Initiatives for this year focussed on employee awareness. The "Greenhouse Gas Emission Reduction Guide" provided articles on reducing waste. These articles were used in employee newsletters and e-mail. These labels with key messages attached to waste paper baskets, printers and faxes, encouraged less paper use and recycling.

A questionnaire sent to all branch heads provided information on habits related to waste. The data provides a baseline which can be used to design information and education and can be tracked to determine changes in habits. The following information was obtained:

- 80.1 per cent use coffee mugs rather than

throwaway cups

- 78.5 per cent recycle their photocopier and printer toner cartridges
- 83.6 per cent use a photocopier with built-in double-siding capability
- 86.4 per cent purchase recycled paper
- 58.9 per cent track paper purchases
- 55.8 per cent purchase reusable office products
- 94.2 per cent reuse office supplies such as binders and file folders
- 90.4 per cent order in bulk and purchase durable and lasting goods
- 80.8 per cent use electronic communications
- 84.5 per cent have the capability to use e-mail, and
- 32.3 per cent have the capability to use computer faxing.

Performance Measures - Waste
<ul style="list-style-type: none">• 11.7 per cent reduction in CO₂ equivalent emissions• 1996 figure for kilograms per employee per year not available

3.2.2 Specific Actions

- Distributed site-specific stickers and posters throughout government offices to alert and encourage paper waste reduction.
- Provided waste reduction tips to departmental coordinators for distribution to government staff.
- Piloted a project to reduce waste in the Action on Waste office in South Petroleum Plaza. Regular garbage cans were substituted with "mini-bins" to reduce the temptation to throw out potentially recyclable materials, and create an awareness of how much garbage (largely lunch wastes) is generated in an office setting. The mini-bin concept was well accepted.
- Investigated five of the 14 representative

provincial government buildings originally audited, to provide ongoing data and to use as case histories/examples for others to follow.

- Reduced waste through furniture recycling and surplus sales of government materials. A comprehensive furniture recycling program makes furniture from one department available to other departments before it is declared surplus. All government surplus material is sold for reuse in the private sector.
- Several initiatives underway to streamline government business which have the potential to reduce paper:
 - More than 50 per cent of all government employees are now accessible through electronic mail, allowing e-mail to replace paper correspondence.
 - An electronic data interchange service, EDI Connect, automates business dealings between government departments and businesses or entities such as oil and gas companies, retailers and wholesalers, and health practitioners. For example, oil and gas companies are able to provide up to 18,000 gas production documents a month to Alberta Energy electronically, rather than having to provide hard-copy documents.
 - New electronic products and services are now available, such as legislative materials on CD Rom, an expanded government intranet and internet site, and on-line access to a wide variety of information and resources.
 - Schoolnet is a national initiative to connect schools across the country and to provide each school with access to Internet services. By the end of 1995/96, 320 schools were participating. In the Grande Yellowhead Regional District a pilot project was initiated to electronically connect schools within the district to one another and to the district

school office in Edson.

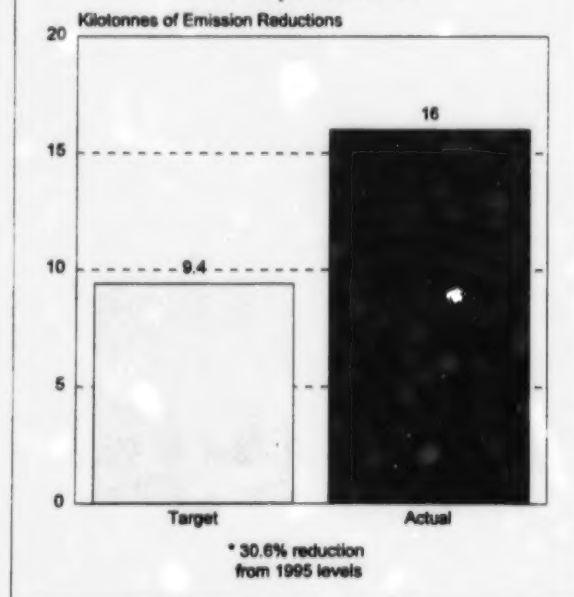
- A pilot project to support health programs connected health facilities within the Chinook Health Region.
- In a pilot project to facilitate searching and interlibrary loan messaging, 24 of Alberta's public libraries were connected through dial-up to the government data network.

3.3 Transportation

3.3.1 Results

Many forms of transportation are used by Alberta government employees. Transportation emissions come from the government fleet of light and heavy duty vehicles, government aircraft, the use of employees private vehicles and flying in commercial aircraft. Overall emissions from transportation have

Figure 6: CO₂ Reductions: Transportation



decreased to 36.4 kilotonnes of CO₂ equivalent, from 52.4 kilotonnes, a reduction of 30.6 per cent (see Figure 6). This reduction exceeds the target of 43 tonnes of CO₂ equivalent set for 1996.

The heavy duty fleet vehicles were privatized thereby eliminating their contribution to the government's greenhouse gas emissions. A large percentage of these emissions will still occur in the private sector. The light duty vehicle fleet decreased in number, but increased in overall kilometers driven, probably due to increased regionalisation and the transfer of some vehicles previously included in the heavy fleet. As a result, heavy duty vehicles contribution was eliminated, down from 14.9 kilotonnes in 1995 and lower than the expected target of 7.4 kilotonnes of CO₂ equivalent. Light duty vehicles contributed 19.5 kilotonnes of CO₂ equivalent, up from 16.1 kilotonnes in 1995 and above the target of 15.8 kilotonnes of CO₂ equivalent.

All government owned aircraft decreased their total mileage over the year. In addition, emissions from 307 hours of fighting fires in Ontario are included in the total emissions. Consequently, greenhouse gas emissions have been reduced from 4.3 kilotonnes of CO₂ equivalent to 3 kilotonnes, a 28.7 per cent decrease over the year and 22.5 per cent below the target of 4 kilotonnes of CO₂ equivalent.

Some government employees use their own personal vehicles to carry out government business. The baseline emissions from personal vehicles was reported as 6.2 kilotonnes of CO₂ equivalent in the 1995-96 progress report. The actual emissions should have been 7.2 kilotonnes of CO₂ equivalent, due to an error in the spreadsheet. Personal vehicle travel decreased to 6.3 kilotonnes of CO₂ equivalent, a reduction of 13 per cent over the year.

Emissions from commercial aircraft used by

government staff to attend meetings, trade shows, conferences and other business are tracked using the total dollars spent from travel expense forms and industry averages for fuel used. The baseline emissions from private aircraft was reported as 6.2 kilotonnes of CO₂ equivalent in the 1995-96 progress report. The actual emissions should have been 9.9 kilotonnes of CO₂ equivalent, due to an error in the spreadsheet. Private aircraft emissions decreased to 7.6 kilotonnes of CO₂ equivalent, a reduction of 23.3 per cent.

To increase awareness about greenhouse gas emissions and develop further information on current transportation practices within government, a questionnaire was sent to the transportation coordinators. The following information was obtained:

- 50 per cent use recycled products such as oil and tires
- driver training for conserving fuel is available for 20 per cent of departments
- energy efficiency criteria is not used for purchasing vehicles
- teleconferencing is used occasionally by 80 per cent of departments
- 50 per cent of departments have their own teleconferencing facilities
- only 10 per cent of government departments with parking policies include energy efficiency as a criteria
- all departments have bicycle compounds available
- vehicles are maintained every 5000 kilometers, and
- two departments have alternative fuelled vehicles.

These results provide information on areas to target. The questionnaire will be used in the future to identify progress in getting departments to take

greenhouse gas emission reduction actions.

The questionnaire sent to all branch heads included questions relating to habits affecting transportation emissions. The following information was obtained:

- 78.5 per cent use alternatives to face-to-face meetings, with conference calls as the most popular alternative
- 82.7 per cent car pool to meetings
- 81.6 per cent schedule meetings to reduce the number of trips
- 62.4 per cent schedule regular maintenance
- 35 per cent provide courses or information on energy efficient driving habits, and
- 50.8 per cent use right-sizing, selecting the proper size vehicle for the job.

Performance Measures - Transportation
<ul style="list-style-type: none">• 30.6 per cent reduction in CO₂ equivalent emissions• Total amount spent on personal vehicle and commercial aircraft travel decreased 18.3 per cent

3.3.2 Specific Actions

- Sponsored and organized vehicle emission clinics for government employees and high school students during energy awareness week.
- Sponsored and organized a bicycle and run/walk clinic for government employees during environment week.
- Piloted a project to assess the cost-effectiveness of coordinating travel on government aircraft. The project has the potential to reduce per passenger greenhouse gas emissions by increasing the number of passengers per flight.

4.0 Supporting Activities

The Alberta government's Action Plan focuses on activities which directly result in reduced emissions from government operations. However, many government activities influence others to reduce their emissions. These supporting activities contribute to the leadership role taken by the Alberta government in encouraging reducing greenhouse gas emissions throughout the province.

4.1 Research Activities

Some of the research projects being supported by the Alberta government in the area of greenhouse gases include:

- Injection of CO₂ into deep Alberta coalbeds for the production of methane - Phase I of this scheme, which is now complete, involved assessment of the technical and economic feasibility of such as scheme. Phase II will begin a field pilot program.
- Assessment of CO₂ in enhanced oil recovery for Alberta - This project will determine the potential of CO₂ in enhanced oil recovery in Alberta and is a follow-up or update to the 1994 AOSTRA study on this same subject.
- International Energy Agency Greenhouse Gas Research & Development programme - The Alberta government has provided on-going support toward the base operating component of this international research initiative.
- The Alberta government provides Secretariat support to the Alberta Chamber of Resources in leading the "CO₂ Synergies Steering Committee". This committee is focused on developing commercial uses for CO₂ through research and development projects, including some of those described above.
- Government departments participate in at least two national initiatives dedicated to

understanding possible climate change impacts to the prairie regions. The government is also supporting a specific adaptation study looking at urban environments and climate change.

4.2 Other Activities

- A consensus was reached in 1994 by government and stakeholders to move towards deregulation of the electric industry. The Electric Utilities Act was passed in 1995 and came into effect January 1, 1996 "to introduce more competition, and strengthen the Alberta Advantage." Restructuring has removed what has been one of the major roadblocks to renewable generation in other jurisdictions: barriers to market access. The open access power pool ensures that existing renewable energy can participate and new projects can enter, and non-discriminatory system access is provided to all sources of generation by the independent transmission administrator. An example of renewables ability to participate is the federal governments recent purchase of windpower from the City of Calgary Electric Utility. Open access has also meant that higher efficiency, lower greenhouse gas emitting technologies, such as natural gas-fired combined cycle and cogeneration units, can now more effectively enter and compete in the new power market. Alberta utilities have advised the government that in their view the next 1000 MW (megawatts) of new generation in Alberta will likely come from natural gas-fired cogeneration plants. Cogeneration provides both process steam and electricity off the same unit, resulting in energy conversion efficiencies of 65-95%.
- The Alberta government has provided significant support for the development and demonstration of renewable power generation technologies. The Small Power Research and Development Act (SPR&D) of 1988, resulted in 18 operational

renewable energy projects in Alberta, including the two largest operating wind farms in Canada. The total value of the contracts enabled by the SPR&D Act is estimated to be in the order of \$25 million for 1997. In 1996, 500 Gwh (gigawatt hours) of electricity was generated under this program. Assuming all power produced will offset an equal amount of fossil generation, this program represents a potential offset of approximately 0.4 MT (megatonnes) of CO₂. Over the next 20 years of the program, a total offset of 4.0 MT of CO₂ may be possible.

- Awareness of climate change issues has increased through development of the school curriculum. The topics of greenhouse gases and global warming are addressed in the curriculum for the compulsory courses of social studies (Grade 11) and in the new secondary science programs (Grades 7-12). The topic is also addressed in optional courses such as environmental and outdoor education (Grades 7-12) and in natural resource studies (career and technology studies, Grades 8-12).
- Other information and educational materials on climate change are made available to the public. Through the Environmental Citizenship Series, two publications have been produced, *A Matter of Degrees: A Primer on Global Warming* and *A Primer on Ozone Depletion*. In addition, the following materials are available: *Focus on Air Quality*, *Focus on Greenhouse Effect*, *Focus on Ozone Depletion*, *A Traveller's Guide to Spaceship Earth - Atmospheric Change and Personal Action*, and a poster titled *Up in the Air*.
- The Department of Agriculture, Food and Rural Development provides farmers with information and education in the areas of energy use, energy efficiency, and alternative and renewable energy.
- Alberta Environmental Protection along with FEESA (an environmental education society)

and TransAlta Utilities are working together to help Alberta communities achieve their vision of sustainability. This partnership, called the Sustainable Communities Initiative (SCI), supports local communities through participation, public education and communication. Over the past year, the partners have helped communities develop action plans on waste, green spaces, transportation, sustainable housing and other grassroots efforts. As SCI continues to grow, Environmental Protection will continue its commitment to support local projects.

- Carbon sequestration was encouraged through programs to encourage planting trees. These programs include: Shelter Belts (Farm) — Trees and shrubs are sold to farmers to protect and beautify their farmsteads and Arbour Day — Seedlings of Colorado spruce, white spruce and lodgepole pine are given to schools for planting by children in Grades 1, 2 and 3. The total distribution of trees in 1996 was 524,380 trees for shelterbelts, plus 78,243 through Arbour Day. In addition, a Tree Seedling Program is implemented during and following Forestry Week. Seedlings from the Pine Ridge Forest Nursery east of Smoky Lake are distributed to school children, organizations, and department staff. In 1996, 35,000 trees were distributed to 130 locations.
- Another program that has an impact on greenhouse gas emission reductions is reforestation of the Alberta Forest. In 1996, the percentage of cumulative area of Crown land harvested that has been successfully reforested, measured by surveys done seven years after harvest was 96.1% for conifers and 93.1% for deciduous trees.
- An Alberta government team was established to educate and promote the idea of greenhouse gas offsets amongst government departments and the

private sector. The team is looking at both domestic and joint implementation offsets. A number of technical papers and presentations were given over the past year.

- The Government of Alberta committed to a new, long term environmental program for the agri-food industry called the Alberta Environmentally Sustainable Agriculture Program. This program will provide funding to rural municipalities, agriculture organizations, agricultural processors, environmental groups and aboriginal organizations to deliver programs on environmentally sustainable agriculture production and processing to farmers, ranchers and processors. Further funding will also be provided for environmental monitoring, extension and applied research to help industry become more environmentally friendly. Funding for 1997/98 is \$5.5 million and \$5 million for the following two years. Greenhouse gas emission reducing actions which will be encouraged and supported include reduced tillage, manure management, waste management, shelterbelts, and woodlot management.
- Alberta Environmental Protection is a funding partner in the implementation of the Post-Consumer Plastic Recycling Strategy. The strategy will be implemented by a multi-stakeholder group with representatives from the three levels of government, resin manufacturers, environmental and industry groups. It will help create a sustainable post-consumer plastics recycling and recovery industry within Alberta.
- The Government of Alberta passed an Order-in-Council authorizing amendments to the Beverage Container Recycling Regulation that removes the exemption for aseptic (juice and drink boxes) and wax paperboard containers (gable-top juice containers). Effective September 1, 1997, these containers will operate on the deposit/refund user-pay system. The

removal of this exemption has the potential to recover and recycle over 60 million juice box containers through the existing beverage container recovery system.

- To reduce waste generated from drilling activities, procedures are implemented for petroleum waste management and disposal requirements. These procedures encourage the reuse of drilling materials and the use of more environmentally benign drilling systems, muds and additives.
- Alberta Environmental Protection operates a comprehensive air and precipitation quality-monitoring program throughout the province. In 1995 this program consisted of 11 continuous (hourly) stations, 8 intermittent (daily) stations, 31 static (monthly and trimonthly) networks and 12 precipitation quality (weekly) stations. At all stations, annual average concentrations of carbon monoxide and nitrogen dioxide were lower than, or close to the same as, the average over the previous 10 years. A substantial decrease in concentrations of both carbon monoxide and nitrogen dioxide is evident in downtown Edmonton and Calgary. These downward trends are due to better emission controls imposed on vehicles, which are the major source, over the last decade.

5.0 Workplan for 1997-98

The Alberta Government's Action Plan is dynamic. It will be updated regularly as new cost-effective actions are identified. Current commitments to action include:

- Aggressive program to audit largest government buildings and follow up with cost-effective retrofits. The retrofits will be delivered through energy performance contracts and through capital and maintenance budgets.

- Building managers will continue to use the Energy Consumption Recording System to compare their consumption with other buildings and take operating and maintenance actions if warranted.
- Three large buildings are planned to receive major retrofits. The three buildings and the projected implementation costs are: Neil Crawford Centre (\$1,500,000), Calgary Correctional Group (\$750,000), and the North Central Buildings Group (\$1,400,000). Other smaller buildings will also receive retrofits.
- Owners of leased facilities will be further encouraged to take actions where cost-effective through increased personal contact. As an incentive, the government will agree to pay the current energy bill for an agreed upon time, if the owner takes cost-effective actions to reduce greenhouse gas emissions. Any savings the building owner makes can be used to pay for an energy performance contract.
- The "Greenhouse Gas Emissions Reduction Guide" will continue to be expanded. The guide is used to educate department staff on how they can take personal action to reduce greenhouse gas emissions. These actions include reducing energy use in their office, reducing office waste, choosing less energy intensive travel, and encouraging others to take greenhouse gas emission reducing actions. The information will be delivered through department newsletters, e-mail and personal contact with department teams.
- A display will be produced and offered to departments for use in the lobbies of their buildings. The display will increase the profile of the program and encourage specific greenhouse gas emission reduction actions.
- A guide to encourage government staff who purchase materials to buy recycled products, particularly paper products, is currently under development. It should be finalized, distributed

and monitored in the fall of 1997.

- The government is working in partnership with the Alberta Used Oil Management Association to establish a used oil, oil filter and container collection program throughout Alberta.
- An interdepartmental working group has been formed to develop a policy on working at home. Telecommuting has been used on a pilot basis by some departments.

6.0 Conclusion

The Alberta Government is taking leadership by reducing its own greenhouse gas emissions. A target of 14.1 per cent reduction (74 kilotonnes CO₂ equivalent) from 1990 levels by the year 2000 has been established. Actions have been taken to meet this target.

In 1996, total emissions of CO₂ equivalent from all government operations decreased to 476 kilotonnes of CO₂ equivalent in 1996 from 527 kilotonnes in 1995, a 9.6 per cent reduction. These reductions exceed the target of 507 kilotonnes of CO₂ equivalent set for 1996. All three sources of emissions contributed to these reductions. The reductions from each source were: buildings, 33 kilotonnes; waste, 1.8 kilotonnes; and transportation, 16 kilotonnes. Part of the reductions are due to downsizing. Although the exact amount is difficult to determine, 20 kilotonnes result from reduced building area. Part of the waste and transportation reductions also result from downsizing.

In summary, the targets set for 1996 have been surpassed, although some of these emissions have probably been transferred to the private sector. Greenhouse gas emissions have gone down 51 kilotonnes through energy efficiency initiatives, employee education programs and downsizing of government. The most significant energy efficient

initiatives are the lighting retrofits of large office buildings, energy performance contracts in groups of buildings, which will lead to long term reductions, and the operations and maintenance changes made by building managers. A cross-government team is implementing actions with support from senior executives. A baseline has been established, performance measures chosen, and targets set. Actions are showing results and these results will be monitored, assessed and reported on in future progress reports.